257 The central agrarian section of Ukraine, on both banks of
311 the Dnipro, includes industries producing foodstuffs and luxuries, above all the sugar industry. There are also plants here for manufacturing leather and medium-heavy machinery. Factories are much smaller than in the coal and ore area and the many small power-stations run on brown coal and peat.

381 The Carpathian area is the home above all of the chemical
311 industry and the capacity of the power-stations, usually run by gas and expensive imported coal, seldom by the abundant water power available, exceeds 10 000 KW only in Lviv — Uzhhorod, being used principally for lighting the towns. Industrialisation is densest on the oil-fields of Drohobych.

391 In the foreland of the Caucasus electric plants are run by
311 petroleum only and water power is not exploited at all. The small factories (petroleum, tobacco, leather and machinery of medium weight) are too scattered to form an industrial area in the strict sense.

392 The large towns form industrial centers that are not dependent
311 on the presence of raw materials. Kharkiv has heavy engineering plants for transportation requirements, factories for agricultural machinery, electro-technical factories, and workshops for precision instruments and machinery. These are large enterprises, built recently and attached to big power-stations (Chuhujiv 25 000 KW), so that Kharkiv may be classed with the industrial area in the vicinity.

39 Kyiv builds ships and produces chemical and electro-technical
311 equipment and has chemical and textile plants as well as sugar and foodstuffs factories. In Odessa the same factories are represented and there are also canneries, leather works and plants for producing cinema installations. In addition, there are workshops that specialise in the structure of motor-cars and planes. In the other towns in the country enterprises for this or that industry have been established.

methods and branches of industry have been introduced, as for instance the production of superior steel and iron alloys. 327

The development of the power-station on the Dnipro entailed a certain change in the location of heavy industry. And the ratio of coal to iron per manufactured unit which was 2.8 : 1 before World War I became 1.6 : 1, though it is still more practicable to transport high quality ores to coal than vice-versa. The Dnipro power-station, however, which is more favorably situated as regards markets and consumption is attracting new foundations of enterprises in heavy industry. This is particularly true of Zaporizha. 371 327

5. Production of Machinery and Metal Goods

Even before World War I, markets were favorable for the production of machinery, above all for agricultural purposes which accounted for the work done for private customers in 126 plants. But modern, large factories were not built till after the war. New branches of production were started, e. g. for motor-cars and tractors (see huge factory in Kharkiv), machinery for mines and precision instruments while the construction of engines and railway trucks increased. The largest factories are in the Donets Combine and in the three large towns; the manufacture of agricultural machines is also distributed over other areas. 392

The non-ferrous metal industry is poorly represented. Between 1914 and 1928 there was practically no increase in the production of mercury (41 000 to 42 000 t). In the Kuban area in 1913 3 000 t zinc and 1 350 t lead were produced; in 1932 these figures were 5 000 and 3 500 t lead respectively. Under the first Five Year Plan zinc factories were erected in connection with the chemical works in Konstantynivka and aluminium works in Kichkas near the power plant on the Dnipro Bend. The annual production of the latter is estimated at 40 000 t. Fuel or power requirements play a greater part than the transportation of raw materials. The production of metal goods is confined to small factories. 328

4: Allen H-4 (no date) 1941 RD1 Ukraine RD1

energy was not of urgent importance. Dnieprostroy supplies neighbouring towns and industrial plants with light and power (including the new 'Dniepr Electrical-Metallurgical Works' and the 'Dniepr Aluminium Works'), but the electrification of the railways of Soviet Ukraine has not yet been undertaken, nor does this appear necessary in view of the cheap supplies of fuel locally available.

As for machine and other mechanical works, there were in existence before 1916: 'Hartmann's Locomotive Works' at Lugansk; the more modern 'Kharkov Locomotive Works' and 'The Electro-Mechanical Works', also at Kharkov; and a series of smaller machine works (particularly for the manufacture of agricultural machinery) at Sumy, Alexandrovsk, Berdyansk, Odessa and Kiev. The Soviet Government considerably enlarged the 'Lugansk Locomotive Works', and recently machine and locomotive works have been in process of construction and subsequent enlargement at Kramatorskaya (in the Donets region). New 'Tractors' Construction Works' have been built in Kharkov. Machinery plants have been founded in Berdyansk and Cherkassy; the old Kiev and Alexandrovsk works have been enlarged; and new agricultural machinery works have been built in Elizavetgrad, Melitopol and Kherson. The shipbuilding works in Nikolaev continue to supply the Black Sea fleet as before the Revolution. There, during the last war, ships were in construction for the Imperial Navy; armour-plate being manufactured in the 'Nikopol-Mariupol Works'.

Some progress has been made in the development of a chemical industry based on the abundant supplies of coal in Donbass. There are chemical processing plants at Slavyansk and Lisichansk, and near the railway stations of Gorlovka and Konstantinovka. The industry is still in the experimental stage, but Soviet 'Plans' envisage the supply of 30 per cent of the needs of the home market.

The Soviet emphasis on the development of Ukrainian heavy industry and a parallel neglect of the possible expansion of light industries has produced a badly balanced economy in Soviet Ukraine and the country remains dependent on other and often distant parts of the Union for the satisfaction of many of the needs of the people. Political considerations which aim at establishing the complete interdependence of the various parts of the Union are at the basis of the particular direction of the Five Year Plans in the Ukraine. The emigré Ukrainian economist, V. Sadovsky, writes: 'In 1934, 69·4 per cent of industry went to the production of materials and of the tools of production, and only 34·6 per cent for general needs. In this sense the relations existing in 1913 were

tion is very clear, buckwheat growing in Zone 1 and millet in Zone 2.[1]

The great development of agriculture has created a growing demand for agricultural machinery, which brought about the appearance and the rapid development of this branch of industry, concentrated to-day especially at Kherson, at Zaporojie, and at Kharkov.

Parallel to this a very important industry of food products has developed. These are the great and highly perfected mills, the sugar refineries, the distilleries, the breweries. and the tobacco factories which cover the whole territory of the Ukraine. As auxiliary products of agriculture, apart from vegetables of all kinds, known in Europe, the production of which is difficult to estimate, one can mention the melons, water-melons, cucumbers, and tomatoes, to the cultivation of which important tracts have been given.

The production of fruit and grapes has not experienced so great a development. The surface given to fruit trees (cherries, apples, apricots, and pears) reaches about 250,000 hectares. The most important horticultural centres are to be found in the region of Ouman, on the banks of the Dniester, at the mouth of the Dnieper, and equally in the surroundings of Odessa, which are famous for their peach trees. The town of Ouman has a horticultural school and an experimental station which had already long before the Great War a great agricultural reputation throughout Russia.

The marketable harvest of fruit reached 80,000 tons before the Great War.

The surplus production of fruits and especially of vegetables (tomatoes) have brought about the rise and the rapid development of a food tinning industry which seemed to offer great possibilities in the future.

As to the vineyards (about 60,000 hectares), they are

[1] [See category 116, pp. 139-140---Analyst]

7:Bregy & Obolensky H-4, 5 (no date) 1940 RD1 Ukraine RD1

377 The functioning of the *Dnieprogues* station, which could open enormous possibilities of development of all kinds of industries and of the electrification of the railways, has nevertheless, despite its enormous power, failed to change the industrial geography of the Ukraine because it is just half-way between the Donietz basin and Krivoi-Rog and thus does not bring about any alteration in the distribution of the sources of energy.

438 Thus the heavy industry of the Ukraine remains, in its greater part, concentrated around this region, round Nikopol and along the northern edge of the Donietz basin.

325 Kharkov and its surroundings are the greatest metallurgical centres of the Ukraine. There great factories of turbines, of generators, of electrical machines, of tractors, of locomotives, of railway trucks, and of factory equipment, etc., are to be found.

327 The production of sheet-iron and of steel rails, tubes, plates, beams, wire, etc., is distributed among many factories of the Donietz basin, at Nikopol and at Dniepropetrovsk.

Zaporojie (not far from Krivoi-Rog and near the *Dnieprogues*) produces nearly 60 per cent of the special steels of the Union. The Soviets intend to create a new powerful centre of metal industry there.

397 Apart from Kharkov, factories producing all the
392 heavier machines such as locomotives are to be found in the Donbass (abbreviation of Donietz basin which we will now use), at Lougansk, and at Kramatorski, where an enormous newly constructed factory is one of the largest in the world.

402 The equipment for the light industry—the mills, wine-presses, oil mills and elevators—is chiefly manufactured at Berdiansk (Donbass), Melitopol (Northern Taurida), Tcherkassy (centre), Kiev, and Odessa.

392 Agricultural machinery comes from the factories of

Zaporojie, Ielisavetgrad (region of Odessa), Berdiansk (on the Sea of Azov), and Kherson (at the mouth of the Dnieper).

The marine docks in which the ships of commerce and of war are being built are at Nicolaiev (at the mouth of the Boug), and river constructions of all types at Kiev. There are important repair shops for railway stock at Odessa and Kiev.

We enumerate here only the districts in which the larger metal industries are concentrated, the production of which exceeds local needs. The greater part of the large Ukrainian towns, especially of the seaports, possess small metal factories, the total production of which is not negligible.

It suffices to consult the economic map[1] of the Ukraine to realize that the heavier the products of the metal industry are, the more its centres are removed from the mining regions, a fact which gives a clearly rational character to the geography of Ukrainian metallurgy.

Besides metallurgy, heavy industry is represented in the Ukraine by the chemical industry and in the first instance by that which is based on coal. Such is the industry which produces azote, benzole, nitro-benzine, and sulphuric acid. Important factories engaged in the production of volatile materials have been built at Gorlovka, Lissitschansk, Konstantinovka, and Slaviansk (in the Donbass). This industry, which is still in its very early stages, already meets 30 per cent of the needs of Soviet Ukraine.

The factories producing superphosphates, whose annual production reaches 250,000 tons, are distributed between Konstantinovka (Donbass), Odessa, and Vinnitza, in Podolia.

Kharkov possesses great dye factories and those producing paints, varnish, and enamel.

[1] [see category 116, p. 151---Analyst]

9: Prothero G-4 (no date) 1920 RD1 Ukraine RD1

433 The development of the industry on a large scale
327 dates from the year 1870, when a British subject named Hughes received from the Russian Government a concession for the manufacture of iron rails. The company founded by him exists to-day under British management at a place called Hughesovka, and is known as the New Russia Co., Ltd. It has been followed up by a great number of other enterprises, some Russian, but most founded by British, French, and Belgian capital, which has been freely invested in the industry during the last forty years, particularly between 1880 and the end of the century.

392 Agricultural machinery is in constant demand.
433 When first used in the country, it had all to be imported, but of late it has been manufactured in the Ukraine in increasing quantities. Although the customs duties on agricultural machinery are low—certain types in fact are admitted free—the machinery made in the country finds more favour every year. For certain complex machines the Ukraine is still dependent upon imports, but, apart from these, it will probably be able in time to produce all the agricultural machinery it needs. In 1913, out of a total of 770 agricultural machinery factories in Russia, 271 were situated in the Ukraine. The value of their output was 31,000,000 rubles, that of the whole of Russia being 54,000,000 rubles. In addition to the production of the factories, large quantities of tools and machinery of the simpler sort are made by domestic workers, working single-handed or in small syndicates.

The principal agricultural machinery works are in the Governments of Kherson, Yekaterinoslav, Taurida, and Kharkov. The firms John Greaves & Co. and E. L. Mathias & Sons (Berdyansk), Hartmann Machinery Co. (Lugansk), H. A. Klassen (Sofiesk), R. & E. Elworthy (Yelisavetgrad), I. I. Hoehn (Odessa), and Franz & Schroeder (Neu-Halbstadt), are among those doing the largest business, and the names of the concerns show how largely foreign enterprise has entered this field, none having a Russian title. At Kiev and Kharkov

9: Prothero G-4 (no date) 1920 RD1 Ukraine RD1

there are several large factories which specialize in every kind of machine necessary for the sugar industry.

Several other industries, while of small account in comparison with those described above, deserve mention.

Manufacturing enterprises dependent upon animal products divide themselves principally into tanneries and woollen factories. The centres of the leather industry lie in the northern portion of the country, especially in the Governments of Kharkov, Poltava, Chernigov, and Podolia. This industry accounts for 4·5 per cent. of the total manufacturing output of the Ukraine. The woollen industry is centred in Kharkov, which has two large cloth mills, and in the town of Klintsi in the Government of Chernigov, where not only cloth but knitted goods, yarns, rugs, shawls, and other woollen goods are turned out from eight considerable factories. The production of woollen goods represents 3·5 per cent. of the total Ukraine output of manufactures.

The timber-working industry is chiefly found in the riparian towns, especially on the Dnieper. Yekaterinoslav takes first place, and Kremenchug, Alexandrovsk and Kherson also have saw-mills. Much of the timber shipped abroad is in an unworked state, and manufactures of the better sort are poorly represented. The industry accounts for only 4 per cent. of the value of the Ukraine manufactures.

The chemical industry is of minor importance. It is concerned chiefly with the products and by-products of coal gas at Odessa and Kharkov, but there is also a soda factory in the Bakhmut district and there are a number of match-factories in the Novozibkovsk district of Chernigov. The products of the industry represent only 3·5 per cent. of the value of the manufactures of the Ukraine. None of the more advanced branches of the industry is established in the country.

The industries enumerated account for 90–95 per cent. of the manufactures of the country. The remainder, grouped under the headings of paper, linen, cotton, and fibre industries, are of negligible account.

23: Shabad N-4 (no date) 1951 R1 Soviet Union R1
Ukraine RD1

metropolitan areas of Moscow, Leningrad, and other industrial centers, as well as the entire southern rail network of the USSR west of the Volga and south of the Moscow coal basin. During the period of the German occupation of the Ukraine (1941–43), the coal mines suffered greatly. At present, reconstruction work is in full swing, mines are being reestablished, and it is hoped to have reached prewar production by the end of the post-war Five-Year Plan. The major coal-mining centers are Stalino, Yenakiyevo, Gorlovka, Kadiyevka, Chistyakovo, Krasnyy Luch, and Sverdlovsk. Anthracite, used principally for fuel, is mined in the eastern and the southern sections, while coking coal is produced in the western and the northern parts of the Donets Basin.

The giant iron and steel mills of the Ukraine lie mainly in the western part of the Donbas, that is, in the coke-supplying area, in the Krivoy Rog iron basin, and along the Dnieper between these two raw-material sources. Among the mills producing over one million tons of pig iron per year are modernized prerevolutionary plants at Makeyevka (Donbas), and at Dnepropetrovsk and at Dneprodzerzhinsk on the Dnieper and new plants at Krivoy Rog, Zaporozh'ye, and Zhdanov. The Azovstal' mills at Zhdanov use Kerch' (Crimea) iron ore, which is shipped across the Sea of Azov.

Machine construction has been developed to a very large extent in the Ukraine in recent years. Due to the close proximity of the sources of metal and in view of the lack of skilled local labor, the Ukraine was designed to produce types of machinery requiring little precision work, but large amounts of metal. Plants located in the Donbas specialize in heavy machine construction; among them, Kramatorsk produces coal-mining and steel-milling machinery, and Voroshilovgrad has a large locomotive works. Agricultural machinery plants are located along the Dnieper and on the right bank. Khar'kov possesses a large tractor plant and locomotive works and produces hydro-turbines and electric motors. There are car-building works at Nikolayev and Dnepropetrovsk, shipyards at Nikolayev, Kherson, and Kiev, and oil-drilling machinery is made in L'vov.

The industrial picture of the Ukraine includes a number of factors suitable for the establishment of a strong chemical industry: the by-products of coking and metallurgical processes, the presence of such important raw materials as salt and phosphorites, the availability of cheap energy produced by coal-fed (*Zugres* and *Shtergres*) or hydroelectric (*Dneproges*) power stations, and finally the need for chemical products